

RELATIVITY OF CHANGE, PARALLEL MOTION, PART AND WHOLE, FIELD OF EFFORT

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Abstract - *In the modern Physics almost as an axiom is accepted that the speed of light is the highest possible terminal velocity by which energy and information transferring in reality is possible. This exposition offers some philosophical reasons in support of the existence of the thesis that there is an "action at a distance" known in quantum mechanics as "nonlocal interaction."*

Keywords : *Einstein, Special Theory Of Relativity, Space And Time, Infinite Speed, Simultaneity, Nonlocal Interaction, Field Of Effort.*

1. INTRODUCTION

In 1905 Einstein published the article "On the Electrodynamics of moving bodies" [1], which gives (lays) the foundation of the Special Theory of Relativity (STR).

Two principles proposed in an axiomatic form perform a basic role in this theory:

1. Invariance principle of the laws of motion in inertial frame of reference.
2. Principle of constancy of the speed of light.

The first of these two principles, Einstein developed from Maxwell's Electrodynamics [2], which shows that in relative movement between the electric wire and magnet flow of electric current occurs.

The reason for the electrical current is either running of conductor on a magnetic field or movement in the magnetic field on the conductor. Einstein combines in one these two possible causes of the same phenomenon, declaring that the relative movement between the conductor and the magnet is the only source of electric current in the conductor. Thus, according to Einstein, disappears the "ghost" of "space which lies in absolute peace" [3 p. 24], defined by Newton, which until now was considered as an absolute frame of reference (ether).

Absolute movement is reduced entirely to the relative, from which it follows that the laws of Mechanics are invariant, we would say also symmetrical, and are valid (true), and do not change with respect to the transition from one reference system to another, provided that these reference systems are inertial.

Thus in Physics a special kind of reference systems and reference points that essentially absolutise the relativity are

introduced, or in other words, define the absolute relativity of Space and Time

This is a paradoxical contradiction, which has the rank of antinomy, and the most common philosophical considerations stand serious criticism. We will present the logic of this criticism in this analysis and will offer reasoning that will solve the conflict in favor of the Action at a distance which in quantum Mechanics is called "Nonlocal interaction."

2. PROBLEM DESCRIPTION

We have to note that when we talk about Action at a distance, in this exposition, we stick to the meaning and content of that concept, in accordance with the ideas of E. Mach [4] and Newton [5], which shall be limited to the existence of interaction performing with infinite speed.

For example, according to Newton, the gravitational interaction between massive objects in the universe is done with infinite speed, and in turn, Max rises to the rank of principle that inertia and inertness of any particular body is dependent on all other masses of the universe and this is a typical case of "Action at a distance".

We continue our analysis with that the Second principle in that article [3], is the Principle of the constancy of the speed of light, which states:

"Each light beam is moving in the coordinate system "at rest" with a certain speed V , regardless of whether this light beam is emitted from a body at rest or a moving body "[3, p. 26].

It is particularly important that, in the formulation of this principle, Einstein does not make explicit requirement for a maximum speed of light in nature, but in all subsequent exposition of that article, he is using the speed of light to define the concept of simultaneity. In the fourth part of the article we read:

"Our thoughts are meaningless for speeds exceeding the speed of light. However, we will be convinced by the following reasoning that in our theory, the speed of light, physically performs the role of infinite speed" [3, p. 34].

Saying that Einstein was correct on two things:

First: Assuming the existence of infinitely greater speed in reality, the conclusions of the STR regarding the relativity of time are not true.

Second, Einstein does not claim unequivocally and categorically that the speed of light is the greatest possible speed in reality. Light only "performs the role of infinite speed" [3, p. 36] within the STR.

In essence, the second of the two principles is a direct conclusion from the experiment of Michelson and Morley, [6, p. 333], which is carried out repeatedly, with increasing accuracy, and that definitely indicates that the speed of light (C) is a constant value, and does not depend on the choice of frame of reference.

But the experiment of Michelson and Morley, is not an experiment proving that the speed of light is the highest possible in reality. Einstein himself probably felt some inconveniences from the hypothesis that the speed of light is the maximum possible ($C = V_{max}$) and made an unexpected conclusion by stating that "the speed of light physically performs the role of infinite speed" [3, p. 23].

Several very important points are contained in this thought:

First: Einstein spoke of "infinite speed", i.e. he acknowledged (assumed ?) that things moving with such speed, not with the speed of light, could exist.

Second: he supposed that in physical terms the speed of light can perform the role of infinite speed.

In other words, by the limited speed of light, the physical phenomena and objects for which it is assumed to move with infinite speed is possible to be described.

We should note straight away that this is a weak point - "Achilles heel" in the views of Einstein. Because it is unacceptable, something more - a complete absurdity to be treated and put under the common denominator physical objects moving at a restricted speed, with physical objects moving with infinite speed (if of course they exist). The difference between them is not just very big and not simply colossal.

The difference is in principle!

This is a Reason due to which, the limited capabilities of the speed of light, which describe the physical characteristics of relative movements, in any case can not cover and explain qualitative physical characteristics of things in which we can assume the existence of infinite speed.

In this regard, two interesting questions arise:

First - who, when and in what occasion defined as a principle that the speed of light in vacuum is the maximum possible in Nature?

Second - Who, when and how has proven this as true?

In relation to the above, it should be noted that, according to the history of Physics [7] Poincaré first expressed the idea that the speed of light is the greatest possible speed in reality at the Congress in St. Louis (USA) in 1904 [8 p. 5].

This is just one expressed idea that as a definition and theorem has never and nowhere been proved, and which is not set as explicitly independent separate, basic and key important PRINCIPLE in the article on Einstein cited by us [1] but despite that, modern Physics accepts this hypothesis as unconditionally true with the rank of Principle.

The most interesting and strange is, that quite intuitively, this principle is often associated with the name of Einstein as the man who proposed first this idea, which however does not correspond to the truth.

Summarizing, we have to emphasize once again that in the modern Physics it is established unambiguously that the speed of light is constant and independent by the frame of reference against which it is measured. But in modern Physics is unclear for what reasons the speed of light is considered as the highest in reality?

Moreover, in modern Physics is unclear why Einstein used the speed of light to determine a simultaneousness of occurring events.

The manner of introduction of these ideas into the science suffers serious criticism from a philosophical cognitive standpoint.

Returning to the beginning of our expose, once again we should stress that the science Physics faces a fundamental rebus, when defining its basic concepts related to the idea of the existence of "Action at a distance" (nonlocal interaction).

The specific problem of modern Natural science is the bearer of the "Action at a distance", which if we use purely physical terms, should appear as some kind of a field is not found yet, thus making the Action at a distance possible itself, and definition of the category "Infinite speed of spreading of" something, most probably "signal", becomes possible.

In this connection it is necessary to bring clarity to the idea of motion with "infinite speed". There are considerations indicating that the reasoning for such a motion is incorrect. The problem comes down to the essence of the phenomenon motion and the phenomenon speed.

In our analysis we will use the following philosophical principle:

PRINCIPLE 1: Any CHANGE (of anything) is (comes down) to a specific type of motion.

Then, the motion in general, is some kind of change, reflected by subject as such, through the difference between the states of things. This is revealed by the following scheme:

THING 1 =>THING 2

THING1 becomes THING 2, whereat we accept that THING 2 is greater than THING 1. In this case the statement is true:

“ Thing two is greater than thing one”. This is indicated on Fig. 1.

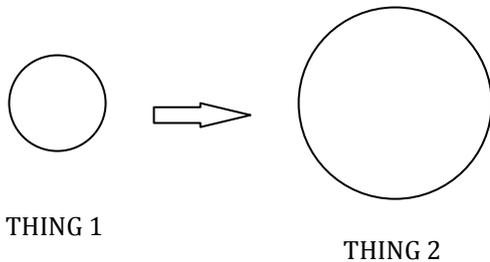
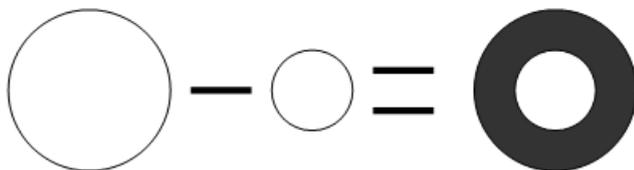


Fig. 1

The next element in the reflection (of the subject) is the appearance of the difference which is thing third in relation to thing one and thing two. The phenomenon difference, the subject indicates by the symbol "delta" thing (Δ THING). The record is now possible:

$$\text{THING 2} - \text{THING 1} = \Delta \text{THING} = \text{THING 3}$$

Where the change Delta thing (Δ THING) is identical with thing three, as indicated on Fig. 2.



$$\text{THING 2} - \text{THING 1} = \Delta \text{THING} = \text{THING 3}$$

Fig. 2

The thing three is neither thing two nor thing one. In this case, the subject expresses the reasoning:

“Thing one has changed into thing two and this is seen and reflected by the difference appearing between the two things, and this difference can be reflected as thing three”.

The described scheme of difference appearance is boundary common, universal, and is an element of the process of reflection inherent to the life and non-life in the reality. In this case, the particular subject (and proto I) reflects the phenomenon of motion.

Only when the subject has reflected the phenomenon motion, the reflection of speed phenomenon becomes possible. This is always done and presented in accordance with the following mathematical recording:

$$\frac{\Delta \text{thing}}{\Delta t} = V$$

Where:

V is a speed of change of the quantity of the thing.

Δ thing is the change of the thing, which we have described as motion phenomenon.

Δt is the change in time which according to PRINCIPLE 1 is the time change which according to PRINCIPLE 1 is phenomenon of motion (with constant speed) by its nature.

It is obvious of the written that phenomenon speed is a result of relation of two motions. The point here is that these are two successively occurring changes in the quantity of some properties.

In the private case it is possible Δ Thing to be moved in space. Moving in space (which is change and motion), brought to the change of time, is a new reflected phenomenon. This new phenomenon, the subject indicates by the term "speed" of relocation.

In the general case, the subject expresses the reasoning: "The change in the quantity of the thing related to the change in the quantity of time is the speed of change of the thing in time."

Now let's see how the "infinite speed" of the movement appears. It has to be recorded:

$$\frac{\Delta \text{thing}}{\Delta t} = V = \infty$$

This is possible when the change of thing one into thing two was made for infinitely short time ($\Delta t = 0$).

$$\frac{\Delta \text{thing}}{0} = \infty$$

This record shows that the change of the thing is made and **simultaneously** covered all PARTS of the WHOLE thing.

We offer such a change to be referred with the concept PARALLEL MOTION, which is fundamentally different from the successive (progressive) motion.

In the case presented by us, thing one appears “as” thing two and this is performed in one moment in time t_0 . This in turn means that in a moment in time t_0 , thing one and thing two exists at the same time, but for some reason, at this point of time, the subject ceases to reflect thing one and begins to reflect thing two. In this case the reflection of the phenomenon of parallel change is possible.

The analysis we make shows the huge principle difference between two types of motion we assert are possible in the reality. The first comes to the idea of successive motion which is progressive and is always accompanied by the phenomenon of speed. The second is a parallel motion in which the change here and now is the reason for the change there and now. In this case, the phenomenon of speed is not possible to be reflected. In this case the WHOLE thing, which is a PART of the WHOLE reality is changed. This in turn is a

general modification of the entire reality, and this parallel shift is outside the progressive nature of the changing amount of time.

The question arises: Is it right to speak of infinite speed? The answer is no. The reason is that the essence of the phenomenon of speed comes down to progressive (subsequent) change that is possible relevant to another progressive change.

The infinite speed is parallel change (motion) in its essence and is a phenomenon which by its deep nature is a QUANTUM TRANSITION in the macro reality.

Generally a phenomenon one terminates its existence (which in our hypothesis cease to be reflecting) and is replaced by phenomenon two that becomes reflecting, and thus existing.

The brief analysis of the phenomenon infinitely great speed makes possible the clarification of the essence of quantum phenomenon.

In creation of a modern physical picture of reality, an important role is performed by the Uncertainty principle of Heisenberg.

The phenomenon uncertainty is associated with the basic mathematical pattern used in the quantum mechanics:

$$E = h \cdot \nu$$

Where:

E is the energy of the quantum.

ν is the frequency of the quantum

h is Planck's constant.

The principle of uncertainty is represented by the following two questions that contemporary quantum mechanics is not able to answer:

Where is the quantum, when it is?

When a quantum where it is?

The reason for the lack of answer is rooted in the Planck constant, which is constant, and (has) possess dimension of (relative?) minimum amount of kinetic energy.

In accordance with quantum mechanics, and in accordance with our hypothesis, the energy of the quantum mechanical objects is changed at a leap, in portions, which is a PARALLEL CHANGE of the WHOLE "quantum". Change covering all PARTS of the WHOLE, which is an action at a distance or nonlocal interaction whereat the WHOLE quantum interacts with the WHOLE reality as a WHOLE with a WHOLE. Such change is performed in the present and logical is absolutely simultaneous for the whole reality. The moment of the present is an interval of time equal to zero, and separates the past from the future.

Absolute present is relevant only as a whole to the past and the future, thus the parallel changes of reality appear.

The parallel changes themselves receive existence in the only present where and in which it is possible to relate to each other as whole things to other whole things. In this case the successive movement is also possible, where the relative reason and consequence appear, which is different from the absolute reason and consequence.

This is the only way in which the phenomenon of interruption in the uninterruptedness of reality is possible.

The purpose of our analysis is to prove the existence of logical absolute simultaneity, and in this regard extremely important question arises: What is the bearer of this simultaneity, or put another way, what is the phenomenon by which this simultaneity may become, reduced to, a measurable physical value.

The answer to these two questions comes down to finding physical evidences, empirical data and facts that show clearly the existence of parallel motions in the whole reality, which in modern science are known as action at a distance (in the classical mechanics of Newton) or a nonlocal interaction (in quantum mechanics).

3. DISCUSSION

Once again we have to pay attention to the fact that contemporary science is unable to indicate the bearer of the action at a distance or what is the same - to specify a field which makes nonlocal interaction between things possible.

In this regard, and as a result of the analysis made, we offer the bearer of the action at a distance to be called (designated) with the conception FIELD OF EFFORT [9], which generally is the product of the mass of the thing and the third derivative of the route and time, as shown in "The Paradox of the stick"[9].

It is not excluded that this still unexplained physically and uncertain field, to turn out as base and key to the deepest secrets of the Absolute Motion and its occurring entities in the direction of Space, Time and the manner they are constructed and exist in real things of Nature.

4. CONCLUSION

In purely practical plan, technological mastering of the action at a distance (infinite speed) would provide humanity with unlimited information freedom to communicate with the WHOLE objective REALITY and its COMPONENTS simultaneously.

If however, this task - the distant technological mastering of the action at a distance turns out to be the most unattainable dream, then mankind will forever remain in the captivity of the limitations imposed by the Time, Space and Motion.

The contemporary development of philosophical - physical idea of reality inspires optimism, which gives hope that this will not happen.

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